

7. RESEARCH AND DEVELOPMENT EXPENDITURES

In the last one hundred years, science and technology have fundamentally transformed our lives, from the ways we travel and communicate, to the food we eat; from the manner in which we learn, to the quality of our health care and our ability to create a cleaner environment. The next century offers new fields of research and innovation and potential solutions to some of society's most pressing challenges. Technological advances continue to strengthen the ties between Americans and the rest of the world, enabling new business endeavors, providing access to news and information from anywhere on the globe, and improving cultural understanding. As the forces of innovation and globalization gain momentum, the 21st Century promises to be an era of great opportunity for the entire world, propelled by new and remarkable developments.

In the latter half of this century, the Federal Government has played a critical role in spurring and sustaining scientific and technological advances. Among other feats, Government-sponsored research and development put Americans on the moon, explored the oceans, boosted agricultural productivity, harnessed the atom, devised more effective treatments for cancers, found the remains of lost civilizations, tracked weather patterns and earthquake faults, created the Internet, and deciphered the chemistry of life. Numerous studies show technological innovation and scientific discovery generated at least half of the Nation's productivity growth over the last 50 years, created millions of high-skill, high-wage jobs, and improved the quality of life in America.

In the last year alone, Federal government funding of research and development produced numerous impressive results, including the first photograph of a planet outside our own solar system, creation of the world's fastest supercomputer, identification of the gene that causes Parkinson's Disease, and a host of other notable achievements.

The future holds even greater possibilities. Scientists and engineers in many disciplines are within reach of even more exciting advances. Building on decades of experimental and theoretical developments, they will be able to rely on new and sophisticated research tools for future discoveries—supercomputers that can make trillions of calculations in a second, particle accelerators and electron microscopes that can decipher atoms and the nature of matter, and space telescopes that can reach to parts of the universe previously unexplored. In particular, computational science—supercomputer modeling of extremely complex systems such as the global climate, the human body, and galaxies—is emerging as a new and significant branch of research, providing insights not likely to occur through experimentation or theorizing alone.

Continued leadership in science and technology is a cornerstone of the President and the Vice President's vision for America. The Administration is proposing \$77.1 billion in outlays for research and development (R&D) activities in 2000, including \$38.7 billion for civilian R&D—a six percent increase over 1999. Chapter Seven of the *Budget* includes a lengthier discussion of R&D activities and shows budget authority data.

Table 7-1. FEDERAL RESEARCH AND DEVELOPMENT EXPENDITURES

(Outlays, dollar amounts in millions)

	1998 Actual	1999 Estimate	2000 Proposed	Dollar Change: 1999 to 2000	Percent Change: 1999 to 2000
By Agency					
Defense	37,844	37,186	34,992	-2,194	-6%
Health and Human Services	12,685	14,226	15,582	1,356	9%
National Aeronautics and Space Administration	10,251	10,032	9,620	-412	-4%
Energy	6,730	7,194	7,495	301	4%
National Science Foundation	2,302	2,334	2,634	300	11%
Agriculture	1,546	1,671	1,707	36	2%
Commerce	835	862	864	2	0%
Interior	451	519	618	99	19%
Transportation	661	573	1,324	751	131%
Veterans Affairs	564	658	662	4	1%
Environmental Protection Agency	527	638	652	14	2%
Other	958	966	983	17	2%
TOTAL	75,354	76,859	77,133	274	0%
By R&D Type					
Basic Research	14,892	16,248	17,598	1,350	8%
Applied Research	14,545	15,447	15,916	469	3%
Development	43,325	42,281	40,560	-1,721	-4%
Equipment	937	937	1,021	84	9%

Table 7-1. FEDERAL RESEARCH AND DEVELOPMENT EXPENDITURES—Continued

(Outlays, dollar amounts in millions)

	1998 Actual	1999 Estimate	2000 Proposed	Dollar Change: 1999 to 2000	Percent Change: 1999 to 2000
Facilities	1,659	1,950	2,038	88	5%
TOTAL	75,354	76,859	77,133	274	0%
By Civilian Theme					
Basic Research	13,839	15,096	16,448	1,352	9%
Applied Research	10,410	10,923	11,350	427	4%
Development	8,370	8,343	8,616	273	3%
Equipment	608	608	707	99	16%
Facilities	1,251	1,455	1,581	126	9%
SUBTOTAL	34,478	36,425	38,702	2,277	6%
By Defense Theme					
Basic Research	1,053	1,152	1,150	-2	0%
Applied Research	4,135	4,524	4,566	42	1%
Development	34,951	33,934	31,950	-1,984	-6%
Equipment	329	329	314	-15	-5%
Facilities	408	495	457	-38	-8%
SUBTOTAL	40,876	40,434	38,431	-2,003	-5%
R&D Support to Universities	12,528	13,719	14,427	708	5%